

*Marked-up copy of claims as amended:*

1. (Twice Amended) A method for application of a layer of admixture on the web former unit of a board machine, comprising the steps of: [wherein]

dividing the flow of fresh stock (11) [is divided] into at least two component stock flows (12<sub>1</sub> and 12<sub>2</sub>), of which flows, to at least one component flow (12<sub>1</sub>), which forms a face which will be placed against the face of the layer to be combined with it, at a point (14<sub>1</sub>) before the pump (22), at a point (14a<sub>2</sub>), and/or at a point (14<sub>3</sub>) after the machine screen[,];

adding admixtures [are added in order] to increase the contents of fines in the layers and the bonding strength between the faces; [, and after this]

passing the component flows (12<sub>1</sub> and 12<sub>2</sub>) [are passed] into the multi-layer headbox (44) and further into the gap former; and

wherein the speed of the board machine is higher than 1000 meters per minute.

5. (Amended) A method for manufacture of board in a board machine, comprising the steps of: [wherein]

providing at least one layer in at least one multi-layer headbox includes an admixture; [,]

passing the web [is passed] from the multi-layer headbox through a gap former and combined with at least one web, which is derived from a second combination of a multi-layer headbox or a normal headbox and a gap former; and

wherein the speed of the board machine is higher than 1000 meters per minute.

8. (Twice Amended) A method for layering of an admixture in a web former unit of a board machine in which two or more webs are formed by means of separate web former units and then combined with one another to form a multi-layered web, comprising the steps of:

dividing a flow of fresh stock into at least two component stock flows;

adding of an admixture to a selected one of the at least two component stock flows;

passing said at least two component flows into a multi-layer headbox; and

passing said at least two component flows from said headbox into a gap former;

wherein said selected one of said at least two stock flows is used for forming a first layer of a web, said first layer having a face that will be placed against and combined with a face of a second layer of said web, said admixture being added for increasing a fines content in said first and second web layers and increasing the bonding strength between said combined faces of said first and second web layers; and

wherein the speed of the board machine is higher than 1000 meters per minute.

## **REMARKS**

Entry and consideration of the following amendments and remarks is respectfully requested.

### **Status of the Claims**

Claims 1-15 are pending, claims 1, 5 and 8 having been amended herein.

Claims 1-4 and 8-15 were rejected under 35 U.S.C. §103 (a) as being unpatentable over Turner et al. in view of Egelhof et al. and further in view of Huovila et al..

Claims 5-7 were rejected under 35 U.S.C. §103 (a) as being unpatentable over Turner et al. in view of Egelhof et al. view of Huovila et al. and further in view of Grossmann et al..

### **Claim Rejections Under 35 U.S.C. §103(a)**

Claims 1-4 and 8-15 were rejected under 35 U.S.C. §103 (a) as being unpatentable over Turner et al. in view of Egelhof et al. and further in view of Huovila et al.. Claims 5-7 were rejected under 35 U.S.C. §103 (a) as being unpatentable over Turner et al. in view of Egelhof et al. and further in view of Huovila et al. and further in view of Grossmann et al.. The Examiner's rejections are respectfully traversed.

The present invention is drawn to a method for application of a web layer including additives in the web forming unit of a board machine. The additives are added to the stock in order to increase the fines content in the layer and to promote the bond strength between the faces. Additionally, the stock flow produced out of the same fresh stock is divided into separate component flows. The component flows are passed into a multi-layer headbox and from the headbox into a gap former. The advantage of applicant's method is that the method promotes

formation and strength and internal bond strength for the board. Moreover, the board machine operates at a speed of more than 1000 meters per minute.

The inventors have found that, in order to make distinct piles interlock tight enough, additives to increase the fines content should be added into the layer to be joined to the surface of the layer formed in another former, which addition should be carried out already before the headbox. Hence, although dewatering is intensive, a sufficient amount of fines will remain in that layer and, as a result, the two layers will adhere to each other well enough. Furthermore, this kind of process is not restricted to a certain speed limit or to a certain former type because the feeding of additive may always be increased if necessary.

Applicant has disclosed that a fresh stock flow divided into separate component flows provides an advantage, is used for a particular purpose and/or solves a stated problem. Applicant asserts that when using different stock compositions in a multi-layer headbox, it is difficult to reach a layer purity high enough to reach the benefit that is being aimed at. In other words, the stock composition used in the inner layer will be visible on the outer face of the web. An advantage of the stock system of the present invention is that a single-stock system is used so that each layer of the multi-layer headbox has the same stock composition, and additives for improving the bonding strength are introduced into a layer that will later come into contact with an adjacent layer.

The prior art discloses that when a web is formed by means of a fourdrinier former, the running speed must be much lower than 1000 m/min. Moreover, in the prior art, when an additive that possibly improves bonding strength is applied to the interface, a separate headbox or any other suitable application device has to be constructed and placed in a position where it tends to

become soiled and deteriorates. This procedure of the prior art requires stopping and cleaning of the equipment rather frequently. Therefore, the prior art solution to improving bonding strength of web faces does not function effectively at machine speeds of higher than 1000 meters per minute.

Turner et al. discusses a multi-ply web former in which water is removed from a web in such a way that a higher fines concentration remains in the upper surface of the web which is then adhered to another web and thus the ply bond between the faces is improved. The former of Turner et al. can successfully be used at lower speeds because in it water is removed mainly in the direction of the upper wire. However, at higher speeds, i.e. more than 1000 meters per minute, the dewatering capacity of the former is not sufficient, which is why more efficient dewatering is needed in the direction of both wires respectively. During such web forming the retention is poorer than at lower speeds, which also means that the fines tend to be washed away from the web together with the wire water, causing problems in the form of weak bonding between different plies. This is why it is exceptional to use gap formers in the manufacturing of multi-layer boards. Turner et al. does not disclose a board machine that operates at a speed over 1000 meters per minute as in the claimed invention. Accordingly, Turner et al. does not anticipate or teach the claim invention and a rejection under 35 U.S.C. §103 (a) should be withdrawn.

Huovila et al. does not teach alone or in combination the present invention. Huovila et al. discloses a stock feed system for a multi-layer headbox in which a single stock composition is used which is divided into each layer of the multi-layer headbox and the necessary additives and fillers may be fed separately into each layer. The use of the system according to Huovila et al. in

connection with the former according to Turner et al. would not provide sufficient benefit because the dewatering capacity of Turner's former restricts its use in practice to speeds under 1000 m/min. Then, without a solution according to the present invention, only at low speeds (<1000 m/min) can a sufficiently high fines concentration be obtained in the surface of the web to be joined to another web. Therefore, Huovila et al. can not be combined with the references to render the claimed invention obvious.

Egelhof et al. does not suggest or teach the present invention alone or in combination. Egelhof et al. teaches that a multi-layer headbox 26 may be used to provide a second ply. Said second ply is dewatered in a twin-wire part 20 in such a way that a fiber ply is produced which is richer in fines on the side facing away from the top wire, which is the side of the second ply that is couched together with the top side of the first fiber ply. Egelhof et al. does not, however, teach anything about the stock feed system of the optional multi-layer headbox as in the present invention. Accordingly, Egelhof may not be combined with the references to make the present invention obvious.

Grossmann et al. teaches a forming section comprising two gap formers for forming two plies that are joined together to form a multi-layer paper web. Grossmann et al. does not disclose a board machine with a running speed of higher than 1000 meters per minute. Thus, Grossmann et al. does not teach alone or in combination the claimed invention.

In view of the amendments to the claims made herein and the arguments presented above it is submitted that the Examiner's rejections have been overcome and should be withdrawn.

It is submitted that the present amendment is timely however if any extension is required than this should be considered a petition for an extension of time. If it is determined that any fee

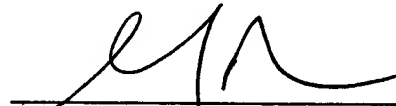
is required for entry of this amendment, the U.S. Patent and Trademark Office is specifically authorized to charge such fee to Deposit Account No. 50-0518 in the name of Steinberg & Raskin, P.C. According to currently recommended Patent Office policy, the Examiner is specifically authorized to contact the undersigned in the event that a telephonic interview would advance the prosecution of this application.

An early and favorable action on the merits is earnestly solicited.


Respectfully submitted,

STEINBERG & RASKIN, P.C.

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